

STATEMENT OF THE CLAIMS

Claims 1-18 (canceled)

19. (new) A continuous process for producing oriented plastic tube, comprising:

providing a variable diameter calibrator which is adjustable in diameter;

adjusting the diameter of the variable diameter calibrator to a first diameter;

in a first mode with the variable diameter calibrator adjusted to the first diameter,

extruding a plastic tube and passing the plastic tube through the variable diameter calibrator,

wherein the plastic tube passing through the variable diameter calibrator in the first mode has a first tube outside diameter;

adjusting the diameter of the variable diameter calibrator to a second diameter different from the first diameter; and

in a second mode with the variable diameter calibrator adjusted to the second diameter, extruding the plastic tube and passing the plastic tube through the variable diameter calibrator, wherein the plastic tube passing through the variable diameter calibrator in the second mode has a second tube outside diameter different from the first tube outside diameter,

wherein extrusion of the plastic tube in the first and second modes occurs prior to temperature conditioning, diametrically expanding, and cooling to produce the oriented plastic tube, the first tube outside diameter results in the oriented plastic tube having a first circumferential draw ratio, and the second tube outside diameter results in the oriented plastic tube having a second circumferential draw ratio different from the first circumferential draw ratio.

20. (new) A process according to claim 19, further comprising:

diametrically expanding the tube by applying an internal pressure to the tube within an expansion zone.

21. (new) A process according to claim 20, wherein:

the internal pressure is limited at a downstream end of the tube by an expandable plug to maintain pressure within the expansion zone.

22. (new) A process according to claim 21, wherein:

the internal pressure is limited at an upstream end of the tube by an upstream plug.

23. (new) A continuous process according to claim 19, further comprising:

adjusting an initial wall thickness of the extruded tube to alter a wall thickness of the oriented plastic tube produced by the continuous process.

24. (new) A continuous process according to claim 23, further comprising:

adjusting the wall thickness of the oriented plastic tube by varying a downstream haul-off speed of the oriented plastic tube,

wherein adjusting the initial wall thickness of the extruded tube includes varying an upstream haul-off speed of the extruded tube.

25. (new) A continuous process according to claim 19, further comprising:

adjusting an extruded tube initial wall thickness and adjusting an initial extruded tube diameter to alter a diameter of the oriented plastic tube produced by the continuous process.

26. (new) A continuous process according to claim 19, further comprising:

diametrically expanding the tube by applying a solid mandrel within a diametrical expansion apparatus

27. (new) A continuous process for producing oriented plastic tube, comprising:

providing a variable diameter calibrator which is adjustable in diameter;

adjusting the diameter of the variable diameter calibrator to a first diameter;

in a first mode with the variable diameter calibrator adjusted to the first diameter,

extruding a plastic tube to a first wall thickness and passing the plastic tube through the variable diameter calibrator, wherein the plastic tube passing through the variable diameter calibrator in the first mode has a first tube outside diameter; and

in a second mode, extruding the plastic tube to a second wall thickness, adjusting the diameter of the variable diameter calibrator to a compensatory diameter different from the first diameter and passing the plastic tube of second wall thickness through the variable diameter calibrator, wherein the plastic tube passing through the variable diameter calibrator in the second mode has a compensatory tube outside diameter different from the first tube outside diameter,

wherein extrusion of the plastic tube in the first and second modes occurs prior to temperature conditioning, diametrically expanding, and cooling to produce the oriented plastic tube, the first tube outside diameter and the compensatory tube outside diameter result in the oriented plastic tube having different oriented plastic tube wall thicknesses in the first and second modes, and the same circumferential draw ratio in the first and second modes.

28. (new) A continuous process according to claim 27, further comprising:

adjusting an initial wall thickness of the extruded tube by varying an upstream haul-off speed of the extruded tube and adjusting the wall thickness of the oriented tube by varying a downstream haul-off speed of the oriented tube.

29. (new) A continuous process according to claim 27, further comprising:

diametrically expanding the tube by applying an internal pressure to the tube within an expansion zone.

30. (new) A continuous process according to claim 29, further comprising:

limiting the internal pressure at a downstream end of the tube with an expandable plug and maintaining pressure within the expansion zone with the expandable plug.

31. (new) A continuous process according to claim 30, further comprising:

limiting the internal pressure at an upstream end of the tube with an upstream plug.

32. (new) A continuous process for producing oriented plastic tube, comprising:

providing a variable diameter calibrator which is adjustable in diameter;

adjusting the diameter of the variable diameter calibrator to a first diameter;

in a first mode with the variable diameter calibrator adjusted to the first diameter,

extruding a plastic tube to an initial extruded diameter and an initial wall thickness and passing the plastic tube through the variable diameter calibrator, wherein the plastic tube passing through the variable diameter calibrator in the first mode has a first tube outside diameter; and

in a second mode, extruding the plastic tube and adjusting the diameter of the variable diameter calibrator to a compensatory diameter different from the first diameter and passing the

plastic tube through the variable diameter calibrator, wherein the plastic tube passing through the variable diameter calibrator in the second mode has a compensatory tube outside diameter different from the first tube outside diameter,

wherein extrusion of the plastic tube in the first and second modes occurs prior to temperature conditioning, diametrically expanding, and cooling to produce the oriented plastic tube, and the first tube outside diameter and the compensatory tube outside diameter result in the oriented plastic tube having different oriented plastic tube diameters in the first and second modes and the same circumferential draw ratio in the first and second modes.

33. (new) A continuous process according to claim 32, further comprising:

adjusting an initial wall thickness of the extruded tube.

34. (new) A continuous process according to claim 32, wherein:

continuous extruding of the plastic tube to the initial extruded diameter is maintained while the oriented plastic tube diameter and the compensatory adjusted diameter are varied.

35. (new) A process according to claim 32, further comprising:

replacing a downstream tube sizing apparatus while extruding the tube to vary the oriented tube diameter.

36. (new) A continuous process according to claim 35, further comprising:

replacing a diametrical expansion plug to diametrically expand the tube and vary the oriented plastic tube diameter.

37. (new) A continuous process according to claim 32, further comprising:

diametrically expanding the tube by applying an internal pressure to the tube within an expansion zone.

38. (new) A continuous process according to claim 32, further comprising:

limiting internal pressure at a downstream end of the tube with an expandable plug and maintaining pressure within the expansion zone with the expandable plug.

39. (new) A process according to claim 38, further comprising:

limiting the internal pressure at an upstream end of the tube with an upstream plug.

40. (new) A continuous process according to claim 32, further comprising:

diametrically expanding the tube with a solid mandrel disposed within a diametrical expansion apparatus.

41. (new) A continuous process for producing oriented plastic tube, comprising:

performing a start-up sequence, including

(i) extruding a tube to a start-up diameter selected to facilitate passage of the tube over a diametrical expansion apparatus during the start-up sequence, and

(ii) passing the tube over the diametrical expansion apparatus;

after the start-up sequence, calibrating the diameter of the extruded tube to an operating diameter which is less than the start-up diameter; and

performing a continuous operating sequence, including

- (i) extruding and calibrating the tube to the operating diameter with a variable diameter calibrator;
- (ii) temperature conditioning the tube;
- (iii) diametrically expanding the tube with a diametrical expansion apparatus; and
- (iv) cooling the tube to produce oriented tube having a circumferential draw ratio.

42. (new) A continuous process according to claim 41, wherein:

diametrically expanding the tube includes applying an internal pressure to the tube within an expansion zone at a downstream end of the tube with an expandable plug, and limiting and maintaining pressure within the expansion zone with the expandable plug,

wherein during performance of the start-up sequence, the expandable plug is in an unexpanded state and the start-up diameter is sufficiently large for allowing the tube to pass over the expandable plug in the unexpanded state.

43. (new) A continuous process according to claim 42 wherein:

calibration of the diameter of the extruded tube to the operating diameter is performed prior to expanding the expandable plug to diametrically expand the tube.

44. (new) A continuous process according to claim 41, wherein:

diametrically expanding the tube includes applying an internal pressure to the tube within an expansion zone.

45. (new) A continuous process according to claim 44, further comprising:

limiting internal pressure at a downstream end of the tube with an expandable plug and
maintaining pressure within an expansion zone with the expandable plug.

46. (new) A continuous process according to claim 45, further comprising:

limiting internal pressure at an upstream end of the tube with an upstream plug.

47. (new) A continuous process according to claim 41, wherein:

a solid mandrel disposed within a diametrical expansion apparatus is utilized to
diametrically expand the tube.